

CLAIMS

What is claimed is:

1. A form, fill and seal packaging machine for forming a package, filling the package and sealing the package, the package being formed from a plurality of upstanding side walls, each contiguous with its adjacent side walls, the carton including a bottom wall contiguous with the upstanding side walls, the bottom wall being formed from a plurality of bottom wall flaps including bottom side wall flaps, a bottom leading flap and a bottom trailing flap, the upstanding side walls defining an open top, and the bottom wall flaps defining an open bottom, the packaging machine comprising:

a carton magazine for storing a plurality of cartons, the cartons being in a flat folded form and having a longitudinal side seal;

a carton erection station for receiving the cartons and opening the cartons to a tubular form;

a rotating turret, the turret rotating to define a turret plane;

a plurality of carton mandrels mounted to the turret for rotation with the turret, each mandrel configured to receive a carton in the tubular form and to carry the carton, the carton positioned on the mandrel such that a bottom of the carton is positioned at a free end of the mandrel;

a carton bottom heater located along a rotational path of the turret;

a carton bottom sealer located along the rotational path of the turret;

a carton bottom panel folding assembly located along the rotational path of the turret, disposed between the carton bottom heater and the carton bottom sealer, the carton bottom panel folding assembly including a pair of opposing rotating members disposed on either side of the carton as the carton traverses passed the folding assembly, each of the rotating members configured to rotate in a plane that is transverse to the turret plane, the carton bottom panel folding assembly including a tucking assembly disposed between the opposing rotating members, the tucking assembly rotating in a plane transverse to the plane of the rotating members and parallel to the turret plane,

wherein when a carton is positioned on the mandrel and passes the folding assembly, the opposing rotating members contact the bottom side wall flaps, urging

the bottom side wall flaps inwardly and the tucking assembly contacts the bottom trailing flap, urging the bottom trailing flap inwardly, over the bottom side wall flaps.

2. The form, fill and seal packaging machine in accordance with claim 1 wherein the folding assembly includes a rotating drive shaft, wherein the opposing rotating members are operably connected to the drive shaft and wherein the tucking assembly is operably connected to the drive shaft.

3. The form, fill and seal packaging machine in accordance with claim 2 wherein the opposing rotating members are operably connected to the drive shaft by a transmission for changing a direction of rotational movement.

4. The form, fill and seal packaging machine in accordance with claim 3 wherein the transmission includes a plurality of gears.

5. The form, fill and seal packaging machine in accordance with claim 4 wherein the gears are bevel gears.

6. The form, fill and seal packaging machine in accordance with claim 2 wherein the tucking assembly includes a mount extending from the drive shaft and a blade disposed at an end of the mount.

7. The form, fill and seal packaging machine in accordance with claim 6 wherein the blade includes a roller at an end thereof.

8. The form, fill and seal packaging machine in accordance with claim 6 including a tab tucker extending from the mount between the shaft and the blade.

9. A bottom folding assembly for a packaging machine, the bottom folding assembly configured to infold the bottom side panels, leading panel and trailing panel of a carton for forming a sealed carton bottom, the packaging machine including a carton magazine for storing a plurality of cartons in a flat folded form, a carton erection station for receiving the cartons and opening the cartons to a tubular form, a rotating turret onto which the cartons are positioned, the turret rotating so as

to define a turret plane, a plurality of carton mandrels mounted to the turret for rotation with the turret, each mandrel configured to receive the carton in the tubular form and to carry the carton with the carton positioned such that a bottom of the carton is positioned at a free end of the mandrel, a carton bottom heater located along a rotational path of the turret and a carton bottom sealer located along the rotational path of the turret, the bottom folding apparatus comprising:

a rotating drive shaft mounted transverse to the turret plane and spaced from a periphery of the turret path;

a pair of opposing rotating members disposed on either side of the rotational path of the turret and operably mounted to the drive shaft, each of the rotating members configured to rotate in a plane that is transverse to the turret plane; and

a tucking assembly disposed between the opposing rotating members, the tucking assembly mounted to the drive shaft for rotating in a plane transverse to the plane of the rotating members and parallel to the turret plane,

wherein when a carton is positioned on the mandrel and passes the folding assembly, the opposing rotating members contact the bottom side wall flaps, urging the bottom side wall flaps inwardly and the tucking assembly contacts the bottom trailing flap, urging the bottom trailing flap inwardly, over the bottom side wall flaps.

10. The bottom folding assembly in accordance with claim 9 wherein the opposing rotating members are operably connected to the drive shaft by a transmission for changing a direction of rotational movement.

11. The bottom folding assembly in accordance with claim 10 wherein the transmission includes a plurality of gears.

12. The bottom folding assembly in accordance with claim 11 wherein the gears are bevel gears.

13. The bottom folding assembly in accordance with claim 9 wherein the tucking assembly includes a mount extending from the drive shaft and a blade disposed at an end of the mount.

14. The bottom folding assembly in accordance with claim 13 wherein the blade includes a roller at an end thereof.

15. The bottom folding assembly in accordance with claim 13 including a tab tucker extending from the mount between the shaft and the blade.